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FINAL REGULATORY EVALUATION, FINAL REGULATORY FLEXIBILITY DETERMINATION, TRADE IMPACT ASSESSMENT, AND UNFUNDED MANDATES ASSESSMENT

FOR

FINAL RULE:

REVISION OF BRAKING SYSTEMS AIRWORTHINESS STANDARDS TO HARMONIZE WITH EUROPEAN AIRWORTHINESS STANDARDS FOR TRANSPORT CATEGORY AIRPLANES

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Executive Summary

This Regulatory Evaluation examines the impacts of a final rule revising the braking systems design and test requirements of the airworthiness standards for transport category airplanes. The amendment moves some of the existing regulatory text, considered to be of an advisory nature, to an advisory circular and adds regulations addressing automatic brake systems, brake wear indicators, pressure release devices, and system compatibility. These revisions were developed in cooperation with the Joint Aviation Authorities (JAA) of Europe, Transport Canada, and the U.S. and European aviation industry through the Aviation Rulemaking Advisory Committee (ARAC). These changes benefit industry by standardizing certain requirements, concepts, and procedures contained in the airworthiness standards without reducing, but potentially enhancing, the current level of safety.

Collectively, the changes will: (1) add appropriate existing JAR requirements to achieve harmonization; (2) move some of the existing regulatory text to an advisory circular; (3) add regulations addressing automatic brake systems, brake wear indicators, pressure release devices, and system compatibility; and (4) consolidate or separate some subparagraphs for clarity.

Most of the changes codify current industry practice or conform FAR § 25.731 and § 25.735 to corresponding sections of the JAR without substantive effects. Incremental costs will total between $20,000 and $40,000 per type certification for one manufacturer of part 25 large airplanes. Similar costs for some manufacturers of part 25 small airplanes are estimated at $40,000 per type certification. According to one manufacturer, cost savings from harmonization, in terms of avoiding added costs of coordination and documentation, will be equal to or greater than the maximum incremental costs

of $40,000 (see section on costs and benefits below for details). Potential safety benefits resulting from specification of minimum accepted standards would supplement these cost-savings, resulting in a significant positive benefit-to-cost ratio.

The rule is not "a significant regulatory action" as defined in Executive Order 12866 and the Department of Transportation's Regulatory Policies and Procedures. In addition, the rule will not have a significant impact on a substantial number of small entities, will not constitute a barrier to international trade, and will not result in the expenditure by State, local or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually.

Regulatory Evaluation of Final Rule: Revision of Braking Systems Airworthiness Standards to Harmonize with European Airworthiness Standards for Transport Category Airplanes

I. Introduction

This Regulatory Evaluation examines the impacts of a Final Rule revising the braking systems design and test requirements of the airworthiness standards for transport category airplanes. These revisions were developed in cooperation with the Joint Aviation Authorities (JAA) of Europe, Transport Canada, and the U.S. and European aviation industry through the Aviation Rulemaking Advisory Committee (ARAC). These changes benefit industry by standardizing certain requirements, concepts, and procedures contained in the airworthiness standards without reducing, but potentially enhancing, the current level of safety.

The changes will: (1) add appropriate existing JAR requirements to achieve harmonization; (2) move some of the existing regulatory text to an advisory circular; (3) add regulations addressing automatic brake systems, brake wear indicators, pressure release devices, and system compatibility; and (4) consolidate or separate some subparagraphs for clarity.

II. Background

This final rule is based on Notice of Proposed Rulelmaking (NPRM) No. 99-16, which was published in the Federal Register on August 10, 1999 (64 FR 43570) and Supplemental Notice of Proposed Rulemaking (SNPRM) No. 99-16A, which was published on December 18, 2000 (65 FR 79298). The related background leading to NPRM No. 99-16, and SNPRM No. 99-16A is as follows.

In 1988, the FAA, in cooperation with the JAA and other organizations representing the American and European aerospace industries, began a process to harmonize the airworthiness requirements of the United States and the airworthiness requirements of Europe, especially in the areas of Flight Test and Structures. Starting in 1992, the FAA's harmonization effort for various systems-related airworthiness requirements was undertaken by the ARAC. A working group of industry and government braking systems specialists of Europe, the United States, and Canada was chartered by notice in the Federal Register (59 FR 30080, June 10, 1994). The working group was tasked to develop a harmonized standard, such as a Technical Standard Order (TSO), for approval of wheels and brakes to be installed on transport category airplanes and to develop a draft notice of proposed rulemaking (NPRM), with supporting economic and other required analyses, and/or any other related guidance material or collateral documents, such as advisory circulars, concerning new or revised requirements and the associated test conditions for wheels, brakes and braking systems, installed in transport category airplanes (FAR §§ 25.731 and 25.735).

The harmonization task was completed by the working group and recommendations were submitted to FAA by letter dated May 1, 1998. The FAA concurred with the recommendations and proposed them in Notice No. 99-16. A Notice of availability of proposed AC 25.735-1X and request for comments and a second Notice of availability of proposed TSO-C135 and a request for comments were also published in the Federal Register on August 10, 1999 (64 FR 43579).

As a result, the FAA received comments from the public in response to the proposed rule (Notice No. 99-16), as well as comments on the proposed AC and the proposed TSO (the JAA also received comments from the public in response to its published notices). Two commenters suggested adding a requirement that the new accelerate-stop test in § 25.735(f) of the NPRM, must be completed on both a new brake and a fully worn brake. The FAA concurred, and revised the accelerate-stop applicable portion of § 25.735(f) to require that the dynamometer testing demonstrate "that the wheel, brake, and tire assembly be capable of absorbing not less than the required level of kinetic energy **throughout the defined wear range** of the brake." Since this new requirement was expected to have incremental costs, it had to be subject to public scrutiny. Therefore, this resulted in a supplemental notice of proposed rulemaking (SNPRM), Notice No. 99-16A, being published for public comment on December 18, 2000. The FAA has considered the comments from both notices in preparing the final rule discussed herein.

None of the commenters to the original NPRM disputed FAA's estimates of specific incremental certification costs. One commenter, however, questioned FAA's contention that costs would be balanced by the savings expected from rule harmonization.

In answer to that commenter's concerns, and based on industry experience with recent type certifications, the FAA re-calculated both the harmonization cost savings as well as the costs attributable to the "proposed" amendments (in the original NPRM), and estimated the costs associated with the new requirement in the SNPRM. These cost estimates are discussed in the next section.

III. Rule Changes and Associated Costs and Benefits

Based on the previous analyses in the economic evaluations for both the NPRM and the SNPRM, the FAA has determined that only two changes in § 25.735(f)- Kinetic energy capacity, will result in any incremental cost increases; those are the dynamometer testing requirements in (f)(2) and (f)(3), pertaining to the "Maximum kinetic energy accelerate-stop" and the "Most severe landing stop (MSL)," respectively.

The maximum kinetic energy accelerate-stop is a rejected takeoff for the most critical combination of airplane takeoff weight and speed. The accelerate-stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that the wheel, brake, and tire assembly is capable of absorbing not less than this level of kinetic

energy throughout the defined wear range of the brake. The energy absorption rate derived from the airplane manufacturer's braking requirements must be achieved. The mean deceleration must not be less than 6 fps^2. The dynamometer test, also called a new brake rejected takeoff (RTO) test, is currently conducted by brake manufacturers as specified by part 25 large airplane manufacturers in the brake qualification specification and is an industry practice as such. For some part 25 small airplane manufacturers, however, the new test will result in a cost increase of $20,000 per type certification. This incremental but nonrecurring cost for some manufacturers of part 25 small airplanes will easily be offset by the harmonization cost savings cited below. Any potential safety benefits from avoiding even one minor accident would add to such benefits.

The most severe landing (or MSL) stop is a stop at the most critical combination of airplane landing weight and speed. The MSL stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that, at the declared fully worn limit(s) of the brake heat sink, the wheel, brake and tire assembly is capable of absorbing not less than this level of kinetic energy. The MSL stop need not be considered for extremely improbable failure conditions or if the maximum kinetic energy accelerate-stop energy is more severe. The MSL requirement, while a new FAA requirement, has been in effect in Europe (per British CAA); consequently, many large part 25 airplane manufacturers currently meet this standard. Notwithstanding, large part 25 airframe and brake manufacturers note that in almost all cases

either the MSL stop energy would not exceed the maximum kinetic energy accelerate-stop energy or, the MSL stop condition is extremely improbable. One part 25 large airplane manufacturer, however, estimates one test in the $20,000 - $40,000 range per type certification. Manufacturers of small part 25 airplanes will experience incremental one-time testing costs totaling approximately $20,000 per type certification.

These incremental, but nonrecurring, costs for some manufacturers of part 25 airplanes will easily be offset by the harmonization cost savings cited below. Any potential safety benefits from avoiding even one minor accident would add to such benefits.

In summary, the incremental costs for the aforementioned new dynamometer tests will total between $20,000 and $40,000 per type certification for one manufacturer of part 25 large airplanes. Similar costs for some manufacturers of part 25 small airplanes are estimated at $40,000 per type certification.

As stated in the Regulatory Evaluation Summary in the SNPRM, the FAA had contacted industry sources to obtain estimated harmonization cost savings attributable to the revisions originally proposed in the NPRM. These cost savings are estimated to be, at a minimum, between $50,000 and $75,000 for a part 25 small airplane type certification and $100,000 to $300,000 for a part 25 large airplane type certification. These harmonization benefits exceeded the incremental costs of all the revisions specified in the NPRM as well as the costs attributable to the SNPRM change. Since there were no public comments to the SNPRM

disputing these estimates, the FAA includes these same benefits in this final rule economic assessment. Given that the rule's incremental benefits exceed the incremental costs for both part 25 large and small airplane manufacturers, the FAA finds the final rule cost-beneficial.

IV. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide-range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis as described in the Act. However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 act provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing

the factual basis for this determination, and the reasoning should be clear.

The subject rule will affect manufacturers of part 25 transport category airplanes produced under future new airplane type certifications. For manufacturers, a small entity is one with 1,500 or fewer employees. No part 25 airplane manufacturer has 1,500 or fewer employees. Notwithstanding, the relatively low annualized incremental certification costs are not considered significant. Consequently, the FAA certifies that the final rule will not have a "significant economic impact on a substantial number of small entities" (manufacturers).

V. International Trade Impact Assessment

The Trade Agreement Act of 1979 prohibits Federal agencies from engaging in any standards or related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and where appropriate, that they be the basis for U.S. standards. In accordance with the above statute , the FAA has assessed the potential effect of this final rule and has determined that it will eliminate regulatory differences between the airworthiness standards of the U.S. and the Joint Aviation Requirements of Europe, without affecting current industry practice. This is consistent with the Trade Agreement Act.

VI. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

The FAA determines that this final rule does not contain a significant intergovernmental or private sector mandate as defined by the Act.